

WHAT IS CLAIMED IS:

1. A method for the treatment of cells in a cell culture, comprising delivering an effective amount of electromagnetic energy having a wavelength in the visible to near-infrared wavelength range to cells in a culture, wherein delivering the effective amount of light energy includes delivering light having a power density of at least about  $0.01 \text{ mW/cm}^2$  to the cells in culture and wherein the delivering the light results in the enhancement or improvement of the cell culture.
2. A method according to Claim 1 wherein the power density is about  $0.01 \text{ mW/cm}^2$  to about  $100 \text{ mW/cm}^2$ .
3. A method according to Claim 2 wherein the power density is about  $0.01 \text{ mW/cm}^2$  to about  $15 \text{ mW/cm}^2$ .
4. A method according to Claim 1 wherein the light energy has a wavelength of about 630 nm to about 904 nm.
5. A method according to Claim 4 wherein the light energy has a wavelength of about 780 nm to about 840 nm.
6. A method according to Claim 1 wherein delivering comprises placing a light source above a top surface of a container holding a cell culture.
7. A method according to Claim 1 wherein delivering comprises delivering a series of pulses of light.
8. A method according to Claim 1 wherein the treatment is broken into at least two treatment periods.
9. A method according to Claim 1, wherein the treatment proceeds for a period of about 30 seconds to about 2 hours.
10. A cell culture apparatus, comprising
  - a reservoir for holding the cells and culture medium;
  - an ambient conditions control system for controlling variables such as the temperature of the culture,  $\text{CO}_2$  levels, and other conditions necessary for cell growth and maintenance; and

a light delivery device comprising at least one light source adapted to deliver electromagnetic energy to the cell culture, wherein light delivered by the light delivery device results in the enhancement or improvement of the cell culture.

11. A method for accelerating the production of a vaccine, comprising delivering an effective amount of electromagnetic energy having a wavelength in the visible to near-infrared wavelength range to cells in a culture, wherein delivering the effective amount of light energy includes delivering light having a power density of at least about  $0.01 \text{ mW/cm}^2$  to the cells in culture; wherein the delivering the light results in the enhancement or improvement of the cell culture; and wherein the cultured cells or products thereof are useful in a vaccine.

12. A method according to Claim 11 wherein the power density is about  $0.01 \text{ mW/cm}^2$  to about  $100 \text{ mW/cm}^2$ .

13. A method according to Claim 12 wherein the power density is about  $0.01 \text{ mW/cm}^2$  to about  $15 \text{ mW/cm}^2$ .

14. A method according to Claim 11 wherein the light energy has a wavelength of about 630 nm to about 904 nm.

15. A method according to Claim 14 wherein the light energy has a wavelength of about 780 nm to about 840 nm.

16. A method according to Claim 11 wherein delivering comprises placing a light source above a top surface of a container holding a cell culture.

17. A method according to Claim 11 wherein delivering comprises delivering a series of pulses of light.

18. A method according to Claim 11 wherein the treatment is broken into at least two treatment periods.

19. A method according to Claim 11, wherein the treatment proceeds for a period of about 30 seconds to about 2 hours.